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10/672,140	09/26/2003	Michael B. Timmons	1153.066US2	8068

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EXAMINER	
POPOVICS, ROBERT J	

ART UNIT	PAPER NUMBER
1724	

DATE MAILED: 11/15/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/672,140	TIMMONS, MICHAEL B.	
	Examiner	Art Unit	
	Robert J. Popovics	1724	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 August 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2,5-14 and 37-42* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,5-14 and 37-42* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

Claims **1,2,5-14** and **37-42** are rejected under 35 U.S.C. 103(a) as being unpatentable over the combined teachings of **AAPA (Applicant's Admitted Prior Art)** in view of either of **Greeleaf (US Patent No. 3,312,348)** and/or **Schulz (US Patent No. 5,032,294)**.

AAPA teaches:

BACKGROUND

[0002] Raising fish in water recirculating systems requires nitrification treatment systems that maintain acceptable levels of ammonia and nitrite within a water supply. A water recirculating system needs to be able to oxidize an ammonia load that is generated by fish as a result of daily fish feedings.

[0003] **FIG. 1 illustrates one type of prior art filtration system 10 that maybe used in a water recirculating system**. The filtration system 10 includes a chamber 12 that contains **microbeads 14**. Microbeads 14 are sufficiently buoyant such that they float on top of filtered water 16 that collects in the bottom of chamber 12. The microbeads 14 on the bottom are partially submerged in filtered water 16 because they support the weight of the microbeads 14 located above them.

[0004] Contaminated water 18 is delivered to filtration system 10 from a number of potential sources, including fish raising tanks where the water supply is contaminated with unsatisfactorily high ammonia loads. **Contaminated water 18 is supplied to chamber 12 from above microbeads 14 using any method that uniformly distributes contaminated water 18 over microbeads 14, such as nozzles 13 arranged in a uniform pattern**. Gravity forces contaminated water 18 downward through microbeads 14 where it collects in the bottom of chamber 12. Contaminated water 18 applies a force to microbeads 14 as it impacts microbeads 14 such that contaminated water 18 submerges some additional microbeads 14. An exit pipe 20 circulates filtered water 16 back to the contaminated water source.

[0005] Microbeads 14 provide a substrate for bacterial growth during operation of filtration system 10. The bacteria on

microbeads 14 utilize the ammonia and nitrite as nutrients for even further bacterial growth. The bacterial growth on microbeads 14 also tends to reduce the buoyancy of microbeads 14. Heterotropic bacteria living on the same beads utilize fine organic solids as nutrients for growth resulting in water polishing and general improvement in water quality.

[0006] **One disadvantage of using a system 10 that includes microbeads 14 is that such systems are limited in size**. In systems with large chambers, the strong buoyancy of microbeads 14 causes microbeads 14 to short circuit the flow of water through microbeads 14 in some areas of the chamber. Short circuiting the flow of water through microbeads 14 inhibits the ability of the bacteria on microbeads 14 to oxidize ammonia loads in the water passing through microbeads 14.

[0007] **The size limitations associated with conventional filtration systems that include microbeads makes it necessary to utilize several chambers when oxidizing commercial ammonia loads** (e.g., 9 kilograms TAN per day) that are generated from commercial fish feedings (e.g., 300 kilograms per day). **The large number of chambers that are required to handle commercial ammonia loads adds unwanted expense to systems that include microbeads 14**.

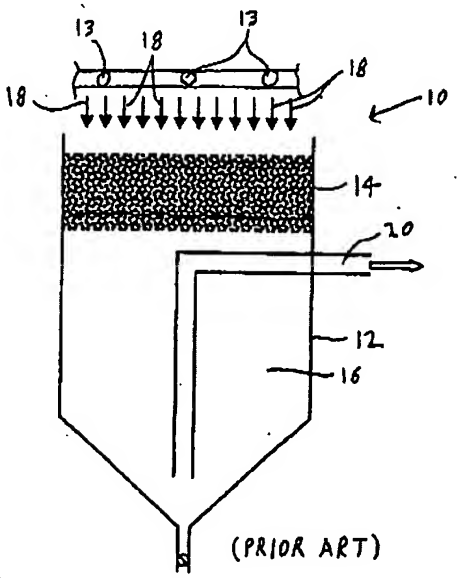


FIG. 1

The system admitted to be ***"prior art"*** by Applicant fails to teach a division of the hydraulic loading area into a plurality of cells with smaller hydraulic loading areas. The issue to be decided is whether it would have been obvious for one skilled in the art to modify the system admitted to be prior art by dividing the hydraulic loading area into a plurality of cells with smaller hydraulic loading areas.

Both **Greeleaf (US Patent No. 3,312,348)** and **Schulz (US Patent No. 5,032,294)** disclose filters employing individual cells. See column 3, lines 20-30 of Greenleaf and Figure 4 of Schulz. In view of these disclosures, it would have been obvious to divide the hydraulic loading area of the system described as "prior art" by Applicant, into a plurality of cells. Such a modification would enable those skilled in the art to keep the majority of cells online, while individual cells are taken off line for periodic backwashing, routine maintenance and/or replacement of media. These advantages would have been readily apparent to those skilled in the art who had reviewed Greenleaf. See, for example, column 1, lines 45-60 and column 2, lines 55-70 of Greenleaf.

The limitations recited in the various dependent claims, e.g., bead diameters, densities, bed depths, etc. are submitted to be inherent, or obvious in view of the references as combined above. In this regard, Applicant's admissions made during the telephonic interview of January 3, 2006, are noted.

With respect to claims 6,7,11, 37 Claim 6 and 11 specify the cells to be ***"square-shaped,"*** while claim 7 specifies ***"wherein each cell has a hydraulic loading area less than 2.3 square meters."*** And claim 37 specifies the hydraulic loading area of the chamber to be greater than 4.6 square meters. The specific shape and size of the cells, absent a showing of unexpected results and/or criticality specifically associated therewith, are design parameters that would have been routinely selected, or optimized by one skilled in the art. Moreover, it is noted that the rectangular shape of the cells disclosed by Schulz is nearly square. Some skilled in the art might even refer to the cells disclosed in Figure 4 of Schulz as being ***"squared-shaped."***

Figure 4 of Schulz

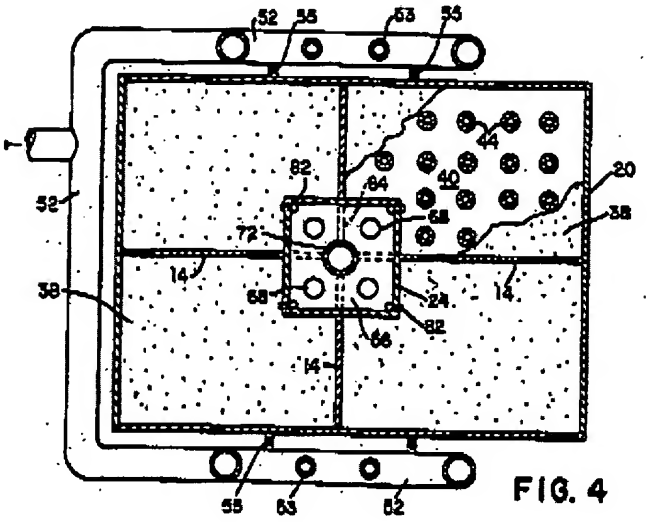
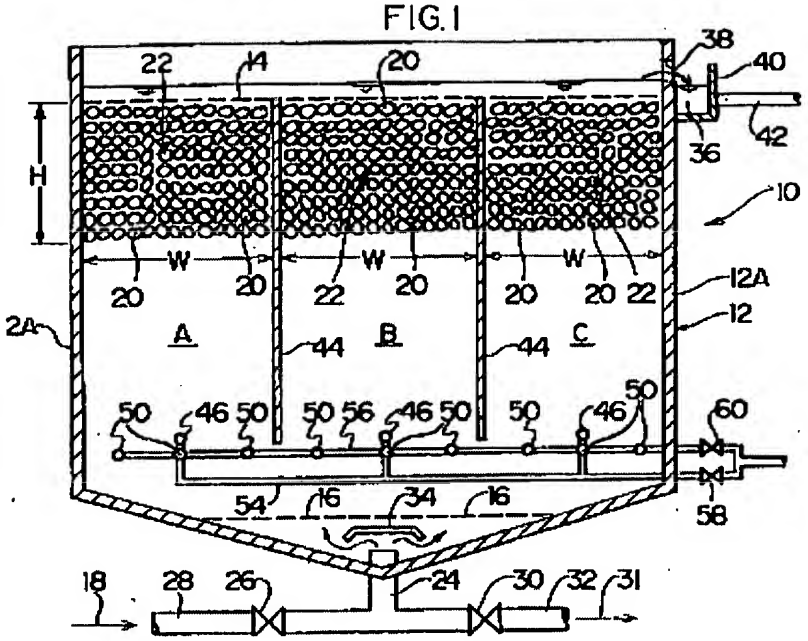


FIG. 4

Claims **1,2,5-14** and **37-42** are rejected under 35 U.S.C. 103(a) as being unpatentable over the combined teachings of **AAPA** (**Applicant's Admitted Prior Art**) and **Funakoshi (US Patent No. 5,558,763)**. AAPA is deficient as discussed above. Funakoshi discloses baffles 44 (see Figures 1 & 10). In view of Funakoshi, it would have been obvious to divide the hydraulic loading area of the system described as "prior art" by Applicant, into a plurality of cells, for the reasons advanced by Funakoshi.

FIG. 1



The limitations recited in the various dependent claims, e.g., bead diameters, densities, bed depths, etc. are submitted to be inherent, or obvious in view of the references as combined above. In this regard, Applicant's admissions made during the telephonic interview of January 3, 2006, are noted.

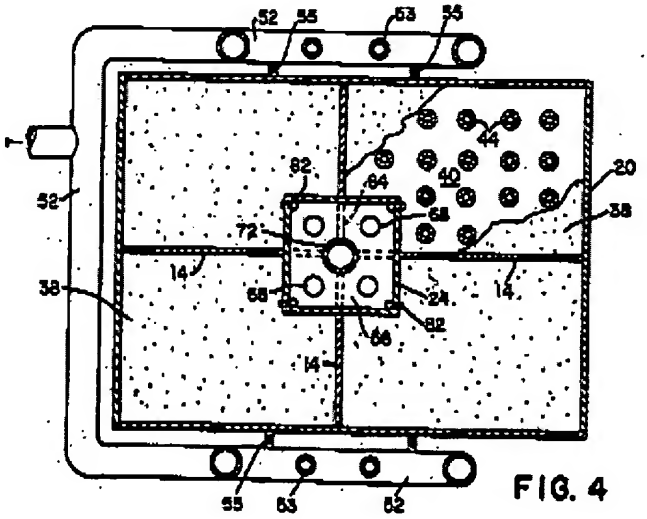
With respect to claims 6,7,11, 37 Claim 6 and 11 specify the cells to be ***"square-shaped,"*** while claim 7 specifies ***"wherein each cell has a hydraulic loading area less than 2.3 square meters."*** And claim 37 specifies the hydraulic loading area of the chamber to be greater than 4.6 square meters. The specific shape and size of the cells, absent a showing of unexpected results and/or criticality specifically associated therewith, are design parameters that would have been routinely selected, or optimized by one skilled in the art.

Claims **1,2,5-14** and **37-42** are rejected under 35 U.S.C. 103(a) as being unpatentable over the combined teachings of **AAPA** (**Applicant's Admitted Prior Art**) and **Junius (US Patent No. 5,573,663)**. AAPA is deficient as discussed above. Junius discloses baffles 350 (see Figure 6). In view of Junius, it would have been obvious to divide the hydraulic loading area of the system described as "prior art" by Applicant, into a plurality of cells, for the reasons advanced by Junius.

The limitations recited in the various dependent claims, e.g., bead diameters, densities, bed depths, etc. are submitted to be inherent, or obvious in view of the references as combined above. In this regard, Applicant's admissions made during the telephonic interview of January 3, 2006, are noted.

With respect to claims 6,7,11, 37 Claim 6 and 11 specify the cells to be ***"square-shaped,"*** while claim 7 specifies ***"wherein each cell has a hydraulic loading area less than 2.3 square meters."*** And claim 37 specifies the hydraulic loading area of the chamber to be greater than 4.6 square meters. The specific shape and size of the cells, absent a showing of unexpected results and/or criticality specifically associated therewith, are design parameters that would have been routinely selected, or optimized by one skilled in the art.

Figure 4 of Schulz



Applicant is again requested to reveal the publication date of the document cited on the **PTO-892.**

Response to Arguments

Applicant's arguments with respect to claims **1,2,5-14** and **37-42** and have been considered but are not found persuasive.

Applicant has argued ***"that a prima facie case of obviousness has not been established because there is no motivation or suggestion to combine AAPA and Schulz or Greenleaf."*** Interestingly, despite quoting the Examiner's motivation (i.e., **"In view of these disclosures, it would have been obvious to divide the hydraulic loading area of the system described as 'prior art' by Applicant, into a plurality of cells. Such a modification would enable those skilled in the art to keep the majority of cells online, while individual cells are taken off line for periodic backwashing, routine maintenance and/or replacement of media."**), Applicant makes this assertion. Applicant then attacks "backwashing," while ignoring the Examiner's two other reasons for dividing the hydraulic loading area, i.e., "routine maintenance and/or replacement of media."

Column one of Greenleaf provides clear reasons why one skilled in the art would have been motivated to employ a plurality of cells in a filter:

> It is an important feature of the invention that, by virtue of its central location and its low level, such a reservoir may communicate through separate ports with each of the filter units, whereby closing of the port for any unit may isolate that unit from the other units of the battery or group during cleaning or repairs, so as to prevent contamination of the filtered liquid supply.

Surely, one skilled in the art would appreciate the need for cleaning or repairs (i.e., maintenance) as expressly taught by Greenleaf. It is noted that Applicant's own specification acknowledges that those skilled in the art have recognized the problems inherent in **"conventional filtration systems"** employing large chambers:

> [0006] **One disadvantage of using a system 10 that includes microbeads 14 is that such systems are limited in size**. In systems with large chambers, the strong buoyancy of microbeads 14 causes microbeads 14 to short circuit the flow of water through microbeads 14 in some areas of the chamber. Short circuiting the flow of water through microbeads 14 inhibits the ability of the bacteria on microbeads 14 to oxidize ammonia loads in the water passing through microbeads 14.
>
> [0007] **The size limitations associated with conventional filtration systems that include microbeads makes it necessary to utilize several chambers when oxidizing commercial ammonia loads** (e.g., 9 kilograms TAN per day) that are generated from commercial fish feedings (e.g., 300 kilograms per day). **The large number of chambers that are required to handle commercial ammonia loads adds unwanted expense to systems that include microbeads 14**.

And, as a consequence of that recognition, employ several chambers as opposed to a single chamber. This recognition alone constitutes sufficient motivation to employ a plurality of cells given the scope and content of the prior art (e.g., teachings of Greenleaf et al.). Regrettably, the specific ***"conventional filtration systems"*** that Applicant discusses at paragraph [0007] are not known to the Examiner. Indeed, the much referenced ***Greiner & Timmons; Aquacultural Engineering (1998)*** discloses a commercial scale system employing three microbead filters:

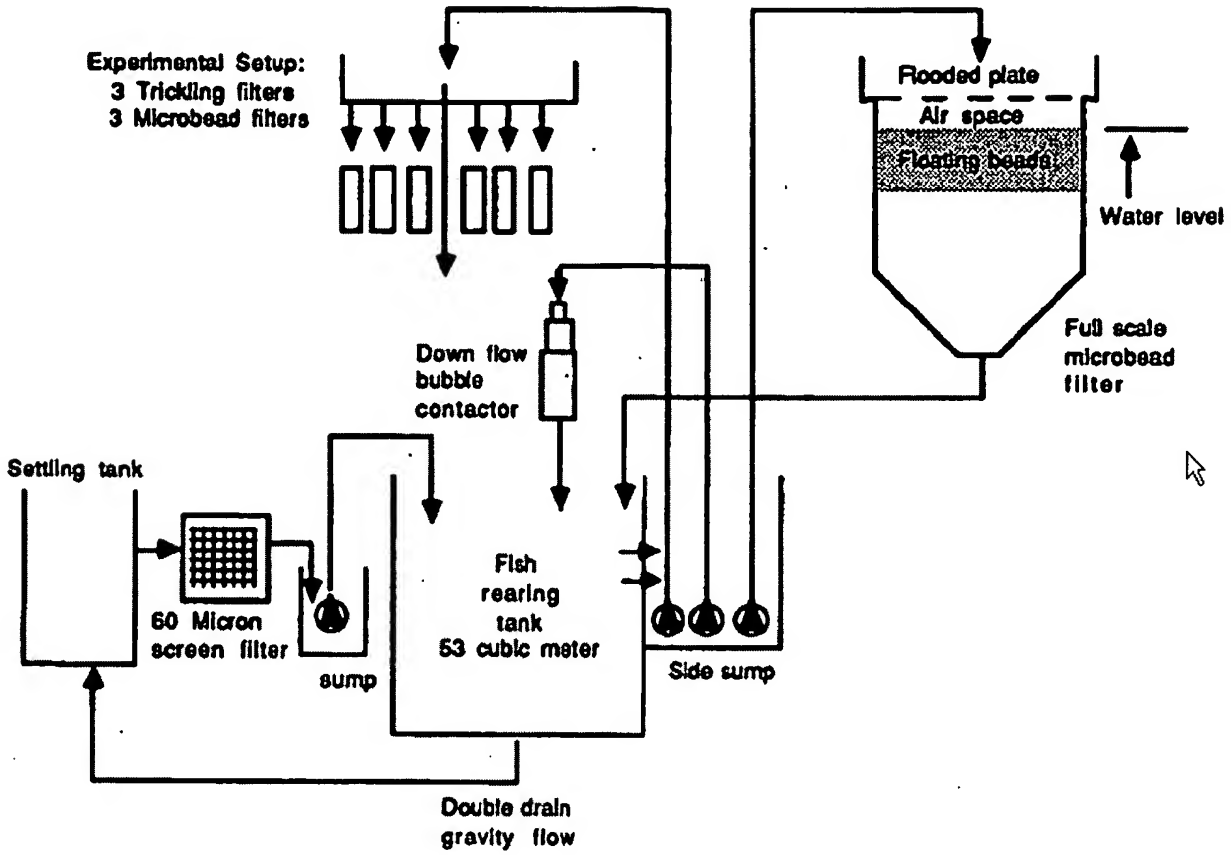


Fig. 1. Commercial scale and pilot scale water reuse systems used to evaluate nitrification rates.

[2] Water Management Technologies, Baton Rouge, LA.

Greiner & Timmons depict those three microbead filters without explanation of why three, and not a single filter is used. Perhaps, the referenced Losordo document, which is not of record, provides an explanation. Presumably, those skilled in the art are so familiar with the problems discussed at paragraphs [0006] and [0007] of the instant specification, than an explanation of those three microbead filters is not necessary. In any event, the use of a plurality of separate chambers, or a single chamber divided using walls/partitions to achieve the same end is seen to be exceedingly obvious.

Applicant next contends:

> Applicant respectfully traverses these assertions and notes for the record that Applicant's attorney stated that the various parameters of the claimed filtration system (e.g., bead diameter, bead density, bed depth, and hydraulic loading area *effect one another*. Applicant's attorney made no mention that that they are inherent or obvious.

On February 28, 2006, a **Notice of Non-Responsive Amendment** was mailed to Applicant. The Response of January 11, 2006 did not include an interview summary. Thereafter, Applicant submitted the following:

> Examiner Interview Summary
> Applicant would like to thank Examiner Robert J. Popovics for the courtesy extended during the telephonic interview on 3 January 2006 with Applicant's representative. Mr. Peret contacted the Examiner regarding the Requirement for Information mailed on November 7, 2005. Mr Peret stated that Figure One was a representative "generic system" that he and the Inventor had drawn. He stated that there was no particular prior art upon which the Figure was based, either in whole or in part. Regarding the particulars pertaining to the "depth of the bed," "densities of the beads," and "diameters of the beads," Mr. Peret indicated that these were interdependent results effective variables, determined by those skilled in the art, based on factors, such as, target contaminant, size of tank and other respective variables, less the one begin determined. Mr. Peret indicated that he would ask Mr. Timmons if there were any publications of the type set forth in paragraph number two of the Requirement for Information. Mr. Peret indicated that he would be filing a response for official consideration. No exhibits were presented, and no agreement was reached.
> The above account is believed to be a **complete and accurate** summary of the interview as required by 37 C.F.R. § 1.133. If the Examiner believes that this summary is inaccurate or incomplete, Applicant respectfully requests that the Examiner point out any deficiencies in his next communication so that Applicant can amend or supplement the interview summary. (Emphasis Added by Examiner)

Applicant was previously given an opportunity to clarify (or "note for") the record when the **Notice of Non-Responsive Amendment** was mailed to Applicant. Apparently Applicant no longer believes that the above is a complete and accurate summary of the interview that took place on January 5, 2006? The Examiner maintains

that the limitations recited in the various dependent claims, e.g., bead diameters, densities, bed depths, etc. are inherent, or obvious in view of the references as combined above, since they are ***"interdependent results effective variables, determined by those skilled in the art, based on factors, such as, target contaminant, size of tank and other respective variables, less the one begin determined."***

Applicant next makes an economic argument:

> Applicant respectfully notes that one of ordinary skill in the art would not look to split a hydraulic loading area into cells when the filter media is microbeads because of increased expense that would be required to fabricate the filtration system. The additional cost would be incurred because of the extra structural members that are required in a filtration system where the hydraulic loading area is divided into cells.

Which is more economical – a plurality of individual filtering chambers, or a single filter chamber partitioned so that it could process the same hydraulic load as the plurality of individual filtering chambers? It is submitted that most individuals without any formal economic training could answer this question. It is of course, less expensive to make the partitioned embodiment.

Applicant next argues:

> Applicant respectfully submits that the only teaching or suggestion as to "the hydraulic loading area being divided into a plurality of cells" where each cell includes microbeads and has a hydraulic loading area less than 2.3 square meters is found in Applicant's specification and claims. Since there is no motivation or suggestion to combine the cited references, the rejection should be withdrawn.

The Examiner maintains that the hydraulic loading area is a design parameter that would have been routinely selected, or optimized by one skilled in the art. For the

record, it is noted that the above argument does not assert that the specifically claimed hydraulic loading area is critical. The hydraulic loading area of each of the three microbead filters depicted above and disclosed in Greiner & Timmons is not known to the Examiner. Moreover, in reviewing the art cited by the Applicant (e.g., ***Greiner & Timmons (1998)*** at pages 198-199) in response to the Requirement for Information, it appears that the mere specification of a hydraulic loading area in the absence of other parameters to arrive at a "rate," is meaningless. Accordingly, the absence of an argument relating to criticality is understood. Interestingly, it is noted that none of the claims specify parameters that would define a ***"Hydraulic Loading Rate (HLR)."***

Regarding the rejection of claims under section 103 in view of the combined teachings of AAPA and Funakoshi, Applicant has argued:

> ... the Examiner has not cited any motivation in Funakoshi to split the chamber into cells when using microbeads having a density that is between 8 kg/cubic meter and 48 kg/cubic meter. It is respectfully submitted that the Examiner's lack of comments relating to a motivation to combine AAPA and Funakoshi amounts to a form of Official Notice, which is timely traversed under MPEP 2144.03. Applicant respectfully requests that the Examiner either cite references in support of this position, or provide an affidavit if the Examiner is relying on personal knowledge, as required by 37 C.F.R. 1.104(d)(2).

Applicant is directed to claim 6 of Funakoshi which specifies, ***"6. A sewage treatment system as set forth in claim 1, wherein a partition is provided in a longitudinal direction in said treatment tank so that a relationship between the treatment tank and the floating filter media layer is set in such a manner that a width/height ratio of said floating filter media layer on each side of said partition is from 0.3 to 1.6."*** The partition of Funakoshi is installed in order to maintain a certain minimum width/height ratio of the floating filter media. Since the width is fixed, this guarantees a certain minimal filtration layer thickness to prevent breakthrough.

It is noted that it further would have been obvious to employ the conventional, commercially available media as disclosed by Applicant, in the system of Funakoshi, given the well known status and functioning of microbeads as biological filtration media.

Regarding the rejection of claims under section 103 in view of the combined teachings of AAPA and Junius, Applicant has argued:

> ... the Examiner has not cited any motivation in Junius to split the chamber into cells when using microbeads having a density that is between 8 kg/cubic meter and 48 kg/cubic meter. It is respectfully submitted that the Examiner's lack of comments relating to a motivation to combine AAPA and Funakoshi amounts to a form of Official Notice, which is timely traversed under MPEP 2144.03. Applicant respectfully requests that the Examiner either cite references in support of this position, or provide an affidavit if the Examiner is relying on personal knowledge, as required by 37 C.F.R. 1.104(d)(2).

Junius, at column 7 provides clear motivation to employ partitions:

Internal partitions (not shown in FIG. 5) divide tank 230 into four compartments 235. Each compartment 235 includes a conveyer means 140 and filter media 11, and contains the same elements and can work, for example, in the same manner as apparatus 110. **The plurality of individual compartments 235 are not in fluid communication with one another unless one connects the effluent of one compartment to the influent of another to make a multi-stage filter apparatus. Otherwise, the filters can filter water from various sources without there being any fluid contact between the sources; this can be useful when one wishes to avoid spreading disease from tank to tank on a fish farm.**

Specification

The disclosure is objected to because of the following informalities: the Brief Description of the Drawings references ***"a prior art filtration system."*** Since no specific system exists corresponding to this drawing, the description and specification need to be amended to reflect what Figure One truly depicts.

Appropriate correction is required.

Request for Publication Date

The Examiner requested that Applicant reveal the publication date of the document cited on the PTO-892. Only one document lacked a publication date.

Applicant responded:

> **Comment Made by the Examiner at Page 8 of the Office Action**
>
> The Examiner states at page 8 of the Office Action that "Applicant is requested to reveal the publication date of the document cited on the PTO-892." Applicant respectfully requests that the Examiner identify with particularity the document that the Examiner is referring to in his request. Applicant will promptly reply to the Examiner's request once clarification is received from the Examiner.

There was only one document cited on the PTO-892 that indicated **"Publication Date Unknown."** It was authored by **Michael B. Timmons**. It was entitled ***"Application of Microbead Biological Filters."*** It was downloaded from: http://www.jlhconsulting.tv/pdf/Microbead_Filter.pdf. Hopefully, this will provide Applicant with sufficient particularity to respond to the Examiner's request.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication should be directed to Robert J. Popovics at telephone number (571) 272-1164.

Robert James Popovics
Primary Examiner
Art Unit 1724